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REMARKS

Claims 1 - 17 are pending in the present application. Claims 13 has been canceled and claims 1, 3, 4, 14, 15, 16 and 17 have been amended, leaving Claims 1 - 12 and 14 - 17 for consideration upon entry of the present Amendment. The Specification has been amended to correct certain typographical errors, as explained in detail below. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

Amended Specification

The specification has been amended to correct for an inadvertent typographical error. The word 'abOut' on page 8, line 23 and on page 9, line 2 was replaced with the word 'about'.

Amended Claims

Claims 1, 3, 4, 14, 15, 16 and 17 have been amended.

Claim 1 was amended to better define the invention, by incorporating the limitation from Claim 13 into Claim 1.

Claim 4 has been amended to remove an inadvertent typographical error. The term 'potassium diphenylsulfon 3 sulphonate' was replaced with 'potassium diphenylsulfone sulphonate'

Claims 14, 15 and 17 have also been amended in order to claim dependency from Claim 1 as a result of the amendment made to Claim 1. In addition, Claim 15 has been amended to remove inadvertent typographical errors. The term 'about' in the claim was twice accidentally mis-spelt as 'abOut', which was therefore replaced.

Amendments to Claims 3 and 16 are addressed below.

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Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 3 - 16 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Examiner states that

Claim 3 and 16 contain improper Markush language.

(Paper 7, page 2)

Claim 3 and Claim 16 have been properly amended to contain alternate language. No new matter has been introduced by these amendments. In addition Claim 16 has been amended to claim proper dependency from Claim 1. Applicants respectfully request a withdrawal of the rejection and an allowance of the claims.

Claim Rejections Under 35 U.S.C. §102(b)

Claims 1 - 12 are rejected under 35 U.S.C. 102(b) as being allegedly anticipated by U.S. Patent No. 5,663,280 to Ogoe et al. ("Ogoe"), U.S. Patent No. 5,041,479 to Ogoe ("Ogoe '479) or U.S. Patent No. 5,399,600 to Buysch et al. ("Buysch") (Paper 7, page 2).

In making the rejection the Examiner states

Ogoe et al ('280) discloses masterbatching KSS and KPTSM in polycarbonate. See from column 18, line 64, to column 21, line 20. The concentrations can be found in column 19, lines 1 - 30. Ogoe ('479) teaches masterbatching 5 - 50% of additives into polycarbonate in the Abstract. See also from column 2, lines 66, to column 5, line 35, for metal salts and concentrations. Buysch recites blending triphenylphosphane sulphonates and polycarbonates in the Abstract. For masterbatching see column 6, lines 8 - 13. Applicants claims are not novel.

(Paper 7, page 3). Applicants respectfully disagree with the rejections.

The claims as presently amended are directed to a method for reducing haze in fire resistant polycarbonate compositions comprising blending flame retardant salt with a first polycarbonate to produce a concentrate; pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition (Claims 1 - 12 and 14 - 17).

Ogoe teaches a carbonate polymer composition comprising a carbonate polymer, a

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low volatility aromatic phosphate ester compound, and optionally an alkali metal salt having a pH of at least 7 (see Abstract). Applicants disagree with the Examiner's contention since Ogoe does not teach all elements of the claimed invention. To anticipate a claim under 35 U.S.C. §102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). It should be noted that the alkali metal salts of Ogoe are referred to as flame retardant salts in the present application. While Ogoe teaches the optional use of alkali metal salts in conjunction with aromatic phosphate ester compounds in polycarbonate resins, it does not teach polycarbonate resins comprising the flame retardant salts and the cyclic siloxane as presently claimed. Since Ogoe does not teach utilizing the claimed cyclic siloxane, it does not teach all elements of the composition and therefore cannot anticipate the claimed invention under 35 U.S.C. §102(b). Applicants respectfully request reconsideration and a withdrawal of the rejection over Ogoe.

Ogoe '479 discloses making a concentrate by pelletizing a carbonate polymer comprising one or more additives selected from the group consisting of a metal salt, a halogenated aromatic compound, a metal salt of an inorganic compound, a free aromatic sulfimide and a fibril forming polytetrafluoroethylene (see Claim 1). Ogoe '479, like Ogoe does not teach blending a cyclic siloxane with a concentrate comprising a polycarbonate resin and a flame retardant salt, as presently claimed. Since Ogoe '479 does not teach the use of a cyclic siloxane in the claimed flame resistant polycarbonate composition, it does not teach all elements of the present claims and therefore does not anticipate the claimed invention. Applicants respectfully request a withdrawal of the rejection over Ogoe '479.

Buysch teaches blends of polycarbonate with triphenylphosphane sulphonates and optionally fluorinated polyolefins (see Abstract). Buysch, like Ogoe '479 and Ogoe does not teach a method for making a flame resistant composition wherein a flame retardant salt and cyclic siloxane are blended with a polycarbonate resin as presently claimed. In particular, since Buysch does not teach the addition of a cyclic siloxane to the claimed concentrate, it does not teach all elements of the present claims, and therefore does not anticipate the claimed composition. Applicants therefore request withdrawal of the rejection over Buysch.

In conclusion, since Ogoe, Ogoe '479 and Buysch each fail to teach one element of

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the present claims i.e. the cyclic siloxane, they do not anticipate the claims of the present invention. Applicants therefore request a withdrawal of the §102(b) rejection over Ogoe, Ogoe '479 and Buysch.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 1 - 17 are rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over U.S. Patent No. 5,663,280 to Ogoe et al. ("Ogoe"), U.S. Patent No. 5,041,479 to Ogoe ("Ogoe '479") or U.S. Patent No. 5,399,600 to Buysch et al. ("Buysch") in view of U.S. patent No. 4,130,530 to Mark et al. ("Mark") (Paper 7, page 4).

In making the rejection the Examiner states

Mark et al. reveals cyclic siloxane plasticizers added to polycarbonates in claims 1 - 6. It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to add the cyclic siloxane plasticizers of Mark et al., to the compositions of the primary references in order to improve the impact strength of the polycarbonate articles.

(Paper 7, page 4). Applicants respectfully disagree with the rejection.

Mark teaches a plasticized polycarbonate composition comprising high molecular weight aromatic carbonate polymer and a minor amount of a cyclic siloxane plasticizer (See Abstract). Mark teaches that the cyclic siloxane plasticizers are added to polycarbonates to maintain impact strength and improve melt flow (see Example I). Applicants' disagree with the rejection on the grounds that the Examiner has not made a *prima facie* case of obviousness over Ogoe, Ogoe '479 or Buysch in view of Mark.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed.

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Cir. 1996).

As stated above, neither of the primary references, Ogoe, Ogoe '479 and Buysch teach the addition of cyclic siloxane to a flame resistant concentrate comprising a flame retardant salt and polycarbonate. The Examiner has asserted that the motivation for adding the cyclic siloxane of Mark to the flame resistant compositions is to improve impact strength (Paper 7, page 4). The Applicants respectfully disagree and believe that there is no such motivation to do so on the grounds that the cyclic siloxane by itself is detrimental to the flame retardancy properties of the polycarbonate when the polycarbonate is not combined with a flame retardant salt.

Evidence of this may be seen in U.S. Patent No. 6,353,046 to Rosenquist et al. ("Rosenquist") as well as in the attached declaration. Rosenquist teaches compositions comprising a perfluoralkane sulfonate and a cyclic siloxane (see Abstract). Rosenquist details compositions containing a cyclic siloxane without any of the fire retardant salt (see the last two samples in Table 2B). The samples showed little or any flame retardant properties as indicated by the 'nd' (not determinable) values shown for the UL94 flame retardancy characteristics (see Table 2B; see also Col. 4, lines 14 - 16). Additionally, the drip performance for these two samples (7 out of 10 and 5 out of 5) is high, which is undesirable for a flame retardant composition.

The flame retardancy characteristics in Rosenquist were evaluated by testing 20 bars using the Underwriters Laboratories UL94 methodology. In order for a composition to display maximum flame retardant performance in a UL94 test, the probability of a first time pass of p(FTP) should be as close to 1 as possible (Col. 3, lines 41 - 52). That the UL94 p(FTP) values could not even be determined is an indication of how the flame retardancy characteristics of a polycarbonate composition containing only the cyclic siloxane are diminished. One of skill in the art would therefore not be motivated to manufacture a flame retardant composition by combining the cyclic siloxane with a polycarbonate containing a flame retardant salt, since it would be expected that such a composition would display inferior flame retardant properties when compared with a polycarbonate composition that contained the flame retardant salt but was devoid of the cyclic siloxane.

Additional data shown in the declaration in Table 1 where a polycarbonate resin was

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compounded with 0.08 parts per hundred (phr) of the flame retardant salt and a cyclic siloxane in amounts of 0.05, 0.1, 0.25, 0.5, 1 and 2 phr respectively also demonstrate that the cyclic siloxane does not improve the impact properties of the composition as contended by the Examiner. As can be seen from the table, the impact strength for the composition containing 0.05 phr of cyclic siloxane was 16.46 ft-lbs/inch while the impact strength of the composition containing 2 phr of the cyclic siloxane was 15.812 ft-lbs/inch. Thus the addition of the cyclic siloxane does not improve the impact strength and these results disprove the Examiner's contention that the motivation for adding the cyclic siloxane was to improve impact.

Additionally, while the impact strength is not improved by the addition of the cyclic siloxane to the flame retardant composition, there is a decrease in other desirable properties such as the softening temperature of the composition when subjected to heat as measured by heat distortion temperature (HDT) method or the Vicat test. From Table 1 it can be seen that the composition having 0.05 phr of cyclic siloxane has a HDT softening temperature of 127.4°C, while the composition having 2 phr of cyclic siloxane has a HDT value of 123.2°C. Similarly it can be seen that the Vicat temperature, which also measures the softening temperature of a composition decreases from 142.9°C to 139°C. It is generally desirable to have as high a value as possible for the softening temperature of a given composition, especially if the composition is to be utilized as a flame retardant composition. Thus the cyclic siloxane not only does not improve impact strength as claimed by the Examiner, but rather acts to reduce the value of other desirable properties such as the softening temperature of the composition. Therefore despite the Examiner's contention that there is motivation to combine the teachings of Ogoe, Ogoe'479 and Buysch in view of Mark to improve impact resistance, there are teachings in Rosenquist as well as observations in the declaration, that would dissuade one of skill in the art from making such a combination.

Further, based upon the results discussed above, one of skill in the art would further anticipate that the addition of a cyclic siloxane to a polycarbonate composition comprising a flame retardant salt would not improve the flame retardancy when compared with a polycarbonate composition containing a flame retardant salt and no cyclic siloxane. From the teachings of Rosenquist however, this appears not to be the case either. A comparison of the

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results of Table 1A with those of Table 1B, clearly shows that the addition of potassium perfluorobutane sulfonate (KPFBS) salt to a polycarbonate in quantities of 0.05, 0.06 and 0.07 phr shows values of p(FTP) of less than 0.2, while the addition of 0.1 phr of siloxane to the same compositions increases the p(FTP) value to above 0.5 for a composition containing 0.05 phr of KPFBS, while for the compositions containing 0.07 phr of KPFBS, the p(FTP) value is greater than 0.99. Similar results can be seen in Table 2A. This clearly indicates that a synergy exists between the flame retardant salt and the cyclic siloxane when added to the polycarbonate.

One of skill in the art, upon being aware of the detrimental flame retardant properties of a cyclic siloxane would therefore not be motivated to add it to a desired flame retardant composition, but upon deliberately choosing to do so, would be surprised at the unexpectedly superior flame retardant properties achieved as a result of the combination.

The present application, in contrast with that of Rosenquist, claims first making a concentrate of a polycarbonate with the flame retardant salt, and then adding to the concentrate the cyclic siloxane and additional polycarbonate. Rosenquist does not teach or disclose making concentrates or masterbatches. In attempting to prove that results obtained by combining the a concentrate containing flame retardant salts and polycarbonate with a cyclic siloxane and additional polycarbonate are unobvious over Ogue, Ogue '479 or Buysch in view of Mark, the Applicants would like to compare results from the present application with those of Rosenquist, where the concentrate approach was not utilized. More specifically the Applicants would like to compare the results of Examples 1 and 2 of the present application with the results shown for the sample fourth from left in Table 1D (hereinafter "sample 4L") of Rosenquist. These samples are similar in composition since they all possess 0.1 phr of KPFBS and 0.1 phr of the cyclic siloxane as well as 0.35 wt% of the pentaerythritol stearate (PETS). Example 1 and sample 4L, both are prepared without utilizing the concentrate approach and are therefore comparative examples, while Example 2 represents the claimed invention. The results shown for haze in Example 1 and 4L (both 3.2 mm samples) are 1.6 and 2.7 respectively, while that for Example 2 is 0.7, which represents an improvement of 56% over Example 1 and 74% over Example 2. All the other comparable properties such as the flame retardancy, and the like, are almost identical for the compositions

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contained in the present application as well as those in Rosenquist. Thus, the sample made utilizing the concentrate approach, i.e., Example 2, clearly shows superior characteristics in at least one property over samples made utilizing the approach detailed in Rosenquist, which does not involve manufacturing and using a concentrate.

In summary, as shown above, the sole addition of a cyclic siloxane to a polycarbonate does not improve the flame retardant properties of the polycarbonate nor its impact properties, but rather reduces the value of other desirable properties such as the softening temperature, and therefore one of skill in the art would not be motivated to add it to a composition where the main desired property was flame retardancy. However, in adding the cyclic siloxane to a flame retardant composition as shown in Rosenquist, unexpectedly superior flame retardant properties were obtained. The present application shows that the use of the flame retardant in a concentrate form produces haze results that are substantially superior to those detailed in Rosenquist as well as the comparative examples of the present application where the concentrate approach was not utilized. In this regard the courts have stated "A greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue." *In re Corkhill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). Since there cannot be a legal conclusion of obviousness Applicants therefore request a withdrawal of the rejection over Ogoe, Ogoe '479 or Buysch in view of Mark.

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It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No.07-0862 maintained by Assignee.

Respectfully submitted,

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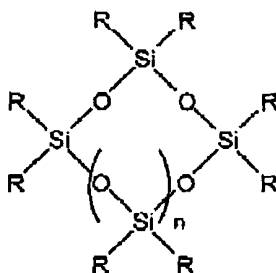
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Please amend the specification on page 8, line 13 – page 9, line 8 as follows in marked up format:

In particular, other flame retarding components may be present in the compositions, for example cyclic siloxanes, at levels effective to impart improved fire-resistance properties. Suitable quantities will generally be in the range of about 0.01 to about 0.5 parts per hundred parts by weight of resin (phr), preferably about 0.02 to about 0.30 phr. Suitable cyclic siloxanes, which may be present, include those having the general formula (V)



(V)

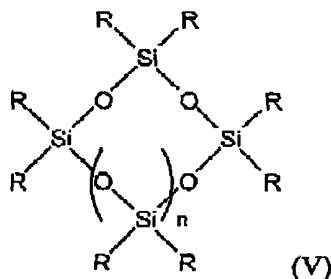
wherein n is 0–7 and each R is independently an alkyl group having from 1 to about 36 carbons, an alkoxy group having from 1 to about 36 carbons, a fluorinated or perfluorinated alkyl or alkoxy group having from 1 to about 36 carbons, an arylalkoxy group having from 7 to ~~about~~ about 36 carbons, an aryl group having from 6 to about 14 carbons, an aryloxy group having from 6 to ~~about~~ about 14 carbons, a fluorinated or perfluorinated aryl group having from 6 to about 14 carbons, and an alkylaryl group having from 7 to about 36 carbons. Specific examples of cyclic siloxanes include but are not limited to octaphenylcyclotetrasiloxane, hexamethylcyclotrisiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, trimethyltriphenylcyclotrisiloxane, and tetramethyltetraphenylcyclotetrasiloxane.

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4. (amended) The method of claim 1, wherein the flame retardant salt is potassium perfluorobutane sulfonate, potassium diphenylsulfonate, potassium diphenylsulfone sulphonate, or a mixture comprising at least one of the foregoing flame retardant salts.

14. (amended) The method of claim 1, wherein the cyclic siloxane is present in the flame resistant polycarbonate composition in an amount from about 0.01 to about 0.5 parts per hundred parts by weight of the total resin.

15. (amended) The method of Claim 1, wherein the cyclic siloxane has the general formula (V)



wherein n is 0-7 and each R is independently an alkyl group having from 1 to about 36 carbons, an alkoxy group having from 1 to about 36 carbons, a fluorinated or perfluorinated alkyl or alkoxy group having from 1 to about 36 carbons, an arylalkoxy group having from 7 to about 36 carbons, an aryl group having from 6 to about 14 carbons, an aryloxy group having from 6 to about 14 carbons, a fluorinated or perfluorinated aryl group having from 6 to about 14 carbons, or an alkylaryl group having from 7 to about 36 carbons.

16. (amended) The method of claim 1, wherein the cyclic siloxane is octaphenylcyclotetrasiloxane, hexamethylcyclotrisiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, trimethyltriphenylcyclotrisiloxane, and/or tetramethyltetraphenylcyclotetrasiloxane.

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17. (amended) The method of claim ~~13~~ 1, wherein the cyclic siloxane is octaphenylcyclotetrasiloxane.